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### REMARKS

Applicants appreciate the detailed examination evidenced by the Official Action mailed March 2, 2005 (hereinafter the Official Action). Applicants also appreciate the indication that the recitations including the Claims 4 and 8 include patentable subject matter. *See Official Action, page 8.* However, rather than rewrite these claims in independent form as suggested by the Examiner, Applicants have elected to maintain these claims in their present form pending a determination of the patentability of the amended claims as described herein below in greater detail.

Applicants have amended several of the claims herein to further clarify the patentable subject matter recited therein in relation to the cited references. In brief, Applicants have amended independent Claim 1 to include the recitations of dependent Claim 2:

wherein the insulation layer comprises a trench thermal oxide layer on an inner wall of a trench in the substrate, the insulation layer extending through the inner side wall of the trench to beneath the active region.

Applicants have also added several new claims which are patentable as described herein below in greater detail. Accordingly, Applicants respectfully request entry of the present amendment and the allowance of all claims for at least the reasons discussed herein.

#### **The provisional election is affirmed.**

During a telephone conversation with the Examiner on February 7, 2005, Applicants' representative provisionally elected Claims 1 – 8 included in Invention I for prosecution. Applicants hereby affirm the provisional election and note that Claims 9 – 21 have been canceled herein. *Official Action, page 3.*

#### **The specification has been amended as suggested.**

The title of the invention has been amended to read as follows: INTEGRATED CIRCUIT STRUCTURES INCLUDING EPITAXIAL SILICON LAYERS THAT EXTEND FROM AN ACTIVE REGION THROUGH AN INSULATION LAYER TO A SUBSTRATE, that is clearly indicative of the present invention to which the elected claims

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are directed as suggested by the Examiner. Applicants therefore respectfully request withdrawal of the objection to the title.

The disclosure has also been objected to on the basis of a typographical error related to a reference numeral in the figures and described on page 6, line 8. *Official Action, page 4.* In response, Applicants have amended the paragraph beginning at page 6, line 8 to correct the typographical error as suggested by the Examiner. Accordingly, Applicants respectfully request the withdrawal of the objection to the specification.

**Claim 2 has been Canceled.**

Claim 2 stands objected to over a typographical error therein. *Official Action, page 4.* In response, Applicants have amended independent Claim 1 to include the essential recitations of dependent Claim 2 while also correcting the cited typographical error. Accordingly, the objection to Claim 2 is now moot.

**Amended independent Claim 1 is patentable over Park.**

Claims 1 - 2 and 5 - 6 stand rejected under 35 U.S.C. § 102 over U.S. Patent Application Publication No. 2002/0047158 to Park et al. ("Park"). *Official Action page 5.* Applicants respectfully submit that amended independent Claim 1 is patentable over Park as evidenced by the following recitations therein:

an isolation structure that electrically isolates an active region of an integrated circuit substrate from adjacent active regions;  
an insulation layer extending from the isolation structure to beneath the active region; and  
an epitaxial silicon layer that extends from the active region through the insulation layer to a substrate beneath the insulation layer, wherein the insulation layer comprises a trench thermal oxide layer on an inner wall of a trench in the substrate, the insulation layer extending through the inner side wall of the trench to beneath the active region.

For example, Applicants respectfully submit that Park does not disclose or suggest, at least, that **"the insulation layer comprises a trench thermal oxide layer on an inner wall of a trench in the substrate, the insulation layer extending through the inner side wall of the trench to beneath the active region."** *Amended independent Claim 1.* Anticipation

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under § 102 requires that each and every element of the claim is found in a single prior art reference. *W. L. Gore & Associates Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983). Stated another way, all material elements of a claim must be found in one prior art source. *In re Marshall*, 198 U.S.P.Q. 344 (C.C.P.A. 1978). "Anticipation under 35 U.S.C. § 102 requires the disclosure in a single piece of prior art of each and every limitation of a claimed invention." *Apple Computer Inc. v. Articulate Systems Inc.* 57 USPQ2d 1057, 1061 (Fed. Cir. 2000). A finding of anticipation further requires that there must be no difference between the claimed invention and the disclosure of the cited reference as viewed by one of ordinary skill in the art. *See Scripps Clinic & Research Foundation v. Genentech Inc.*, 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Additionally, the cited prior art reference must be enabling, thereby placing the allegedly disclosed matter in the possession of the public. *In re Brown*, 329 F.2d 1006, 1011, 141 U.S.P.Q. 245, 249 (C.C.P.A. 1964). Thus, the prior art reference must adequately describe the claimed invention so that a person of ordinary skill in the art could make and use the invention.

As understood by Applicants, the buried oxide layer 51 in Park, which is considered in the Official Action to be the claimed insulation layer, is not in contact with the side wall. Rather, the buried oxide layer 51 appears to be in contact with the bottom of the isolation 41 as shown in Figures 5, 9, 10, and 11 of Park. Furthermore, the buried oxide layer 51 doesn't disclose a thermal oxide layer on an inner side wall of a trench as claimed.

Accordingly, Applicants respectfully submit that Park does not disclose or suggest at least the recitations of amended independent Claim 1 described above. Applicants further submit that the remaining references cited in the Official Action also do not disclose or suggest the recitations shown above to be missing from Park. Furthermore, Applicants submit that dependent Claims 3, 5, 7 and 8 are patentable at least per the patentability of amended independent Claim 1 as described above. Accordingly, Applicants respectfully request the withdrawal of the rejection of Claim 1 and the allowance thereof for at least the reasons described above.

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**The new claims are patentable over the cited references.**

As discussed briefly above, Applicants have added several new independent and dependent claims herein. For example, new independent Claim 22 recites in-part:

an isolation structure that electrically isolates an active region including a plurality of gates from adjacent active regions; and  
an epitaxial silicon layer in the active region between at least two of the plurality of gates extending from the active region to a substrate beneath the active region.

Referring in particular to Figure 9 of Park, as understood by Applicants, isolation regions 41 electrically isolate surrounding active regions (such as peripheral active region 49 from the body 440). This being the case, Applicants submit that Figure 9 of Park does not disclose or suggest an active region including a plurality of gates as recited in new independent Claim 22. For example, as described in some embodiments illustrated by Figures 4, 6, 8 and 10 of Applicants disclosure, the active region 14 can include at least two gates thereon. Furthermore, the insulating layer 24b can extend from the isolation structure to beneath the plurality of gates.

As discussed above, Park does not disclose or suggest a plurality of gates on the active region. Park also does not disclose or suggest an epitaxial silicon layer in the active region between at least two of the plurality of gates extending from the active region to a substrate beneath the active region. For example, as shown in exemplary embodiments according to the invention illustrated by Figures 4, 6, and 10 of Applicants disclosure, an epitaxial silicon layer extends from the active region 14 to the substrate 10. Accordingly, Applicants respectfully submit that new independent Claim 22 is patentable for at least these reasons.

Dependent Claim 23 recites in-part:

an isolation structure that electrically isolates an active region including a plurality of gates from adjacent active regions; and  
an epitaxial silicon layer in the active region between at least two of the plurality of gates extending from the active region to a substrate beneath the active region.

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In addition to the reasons discussed above in reference to new Claim 22, new Claim 23 includes additional recitations which are not disclosed or suggested, for example, by Park. As shown in Figure 10 of the present application, the second and third epitaxial silicon layers are located between the isolation structure 28 and the plurality of gates and extend from the active region 14 to the substrate 10. Accordingly, new dependent Claim 23 is also patentable over the cited references for at least these additional reasons.

New dependent Claim 25 recites in-part:

a second insulation layer extending from opposing portions of the isolation structure to beneath the first insulation layer, wherein the epitaxial silicon layer extends through the second insulation layer.

These recitations also are not disclosed or suggested by the cited references. As shown in exemplary embodiments according to the invention illustrated, for example, in Figure 6 of the present application, a second insulation layer extends from opposing portions of the isolation structure and the epitaxial silicon layer extends through the second insulation layer. Accordingly, new dependent Claim 25 is patentable over the cited references for at least these additional reasons.

New dependent Claim 26 recites in-part "a nitride liner beneath the plurality of gates," recitations which are not disclosed or suggested by the cited references. Accordingly, new dependent Claim 26 is also patentable over the cited references.

New independent Claim 27 recites in-part:

an isolation structure that electrically isolates **an active region including a plurality of gates from adjacent active regions; and**  
**an epitaxial silicon layer in the active region between the isolation structure and one of the plurality of gates and extending from the active region to the substrate.**

As discussed above, the cited references do not disclose or suggest a plurality of gates on the active region. Furthermore, the cited references do not disclose or suggest an epitaxial silicon layer in the active region between the isolation structure and one of the plurality of gates and extending from the active region to the substrate. For example, as illustrated in Figure 8 of the present application, an epitaxial silicon layer is located between the isolation structure 28

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and one of the plurality of gates and is extending from the active region to the substrate. Accordingly, new independent Claim 27 is also patentable for at least these reasons.

New dependent Claim 28 recites in-part "a second epitaxial silicon layer in the active region between the isolation structure and another of the plurality of gates and extending from the active region to the substrate," recitations which are not disclosed or suggested by the cited references. As shown by example in Figure 8 illustrating some embodiments according to the invention, a second epitaxial silicon layer is in the active region between the isolation structure 28 and the other of the plurality of gates and extends from the active region to the substrate. Accordingly, dependent Claim 28 is also patentable over the cited references for at least these reasons.

New independent Claim 31 recites in-part:

an isolation structure that electrically isolates an active region including a plurality of gates from adjacent active regions; and  
an epitaxial silicon layer in the active region extending from a surface of the active region to the substrate.

The cited references do not disclose "a plurality of gates" on the active region as discussed above. Furthermore, the epitaxial silicon layers shown in the figures of Park do not extend from "a surface of the active region to the substrate." For example, Figures 5, 9, 10 and 11 do not show an epitaxial silicon layer extending from a surface of the active region to the substrate. To the contrary, in Figures 9, 10 and 11 of Park, the material in the contact hole (which is described as possibly being epitaxial silicon) extends only from the contact region 60 to partially through the active region. In fact, the material formed on the epitaxial silicon shown in Figures 9, 10, and 11 of Park is described as being an oxide.

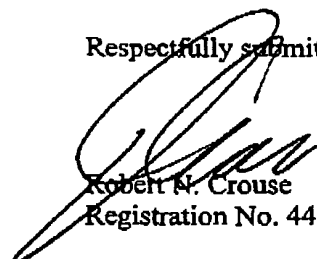
### CONCLUSION

Applicants have amended independent Claim 1 to further clarify the recitations therein and to further distinguish the patentable subject matter recited therein from the cited references. In addition, Applicants have added several new independent and dependent claims which also are patentable. Accordingly, Applicants respectfully request the withdrawal of all rejections and the allowance of all claims in due course. If any informal

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matters arise, the Examiner is encouraged to contact the undersigned by telephone at (919) 854-1400.

Respectfully submitted,

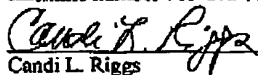


Robert M. Crouse  
Registration No. 44,635

USPTO Customer No. 20792  
Myers Bigel Sibley & Sajovec  
Post Office Box 37428  
Raleigh, North Carolina 27627  
Telephone: 919/854-1400  
Facsimile: 919/854-1401

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Candi L. Riggs